



The Wm. Malcolm 20X Vintage Target Scope (VTS) Instruction Manual



Contact Information:

Website: <https://www.hi-luxoptics.com>

Technical Support Email: info@hi-luxoptics.com

Tutorial Videos: <https://www.youtube.com/c/hiluxinc>

Hi-Lux, Inc.

3135 Kashiwa Street, Torrance, CA 90505, U.S.A.

Tel: (310) 257-8142, Fax: (310) 257-8096

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WARNING:

For safe usage of this scope, it is absolutely necessary that it must be securely mounted to your rifle. The front and rear scope mounts require installation using the crescent cut scope bases. This should be done by a competent gunsmith and requires drilling and tapping of your barrel. Failure to follow this procedure can result in personal injury.

The Malcolm 20X Vintage Target Scope is the premier external adjustment optic for Benchrest shooting or single shot rifles. The Malcolm 20X features an optical system that realizes high magnification with excellent luminosity, which is critical for shooting at extended distances.

To give modern performance to these old style scopes, we precision grind each lens to micron tolerances. Every lens element is individually inspected to ensure that its curvature, centering, diameter and thickness are within tolerance. This ensures optimal image resolution with minimal optical aberration.

We fully multi-coat each lens with the highest quality DiamondTuff14 coating. Each lens surface offers $\geq 99.5\%$ light transmission across the visible light spectrum. The Malcolm 20X Vintage Target Scope offers the brightest, clearest, and sharpest optics ever in a riflescope of this design.

Like our Malcolm 8X Gen II Vintage Sniper Competition scope, the steel tube features a laser spot welded rib for enhanced strength and rigidity. All threads and metallic parts are CNC machined to precise tolerances. All hardware is hardened for optimal durability and mar resistance.

The Malcolm 20X Vintage Target Scope comes with our Vintage Sniper Competition mounts. The rear micrometer is patterned after the Unertl mount. Compatible with crescent cut scope blocks, these mounts offer precise $\frac{1}{4}$ MOA adjustment clicks when the front and rear mount are spaced 7.250" from center to center. This mount has virtually zero backlash and ultra tactile adjustment clicks.

Parallax adjustment is located on the objective end of the Malcolm 20X Vintage Target Scope. Focusing parallax for your desired distance is accomplished through axially shifting the objective lens housing by turning the lock ring and index ring. The range calibrated scale on the objective bell, in conjunction with the 10 division index ring, will aid in accurate and consistent parallax adjustment.

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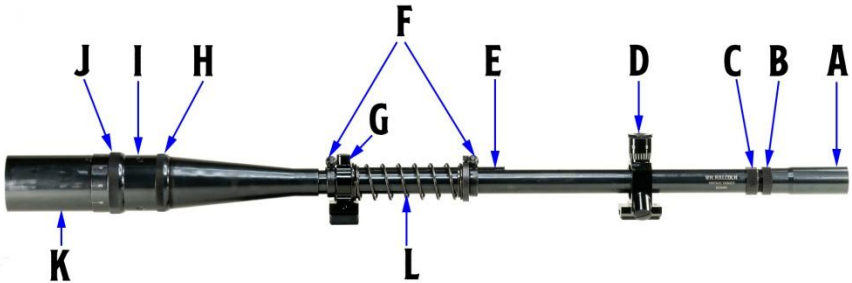
Section 1: Malcolm 8X VTS Scope Specifications

Model	Power	Obj. (mm)	F.O.V. @ 100 Yds (ft)	Eye Relief (in)	Length (in)	Weight (oz)	Exit Pupil Range (mm)	Tube Size (in)
M20VTS	20X	41mm	4'	2.4"	25.75	32	1.9mm	¾

All lens surfaces are fully multi-coated with DiamondTuff14 for maximum light transmission and scratch resistance. The reticle is a fine crosshair.

The micrometer rear mount offers precise elevation and windage click adjustments. Each click offers ¼ MOA when the front and rear mounts are spaced 7.250" apart, center to center. One full turn has 25 clicks. The turrets can be reindexed after zeroing.

Section 2: Basic Definitions and Adjustments



A) Eyepiece

The eyepiece is located at the rear end of the scope. This is the part that you look through when using the Malcolm VTS scope. You can rotate the eyepiece clockwise and counterclockwise to adjust the diopter setting to your eyesight. Once the eyepiece has been adjusted for your eyesight, you can use the knurled lock ring to secure the eyepiece in place. Tighten the lock ring to finger tight only. **DO NOT USE TOOLS TO TIGHTEN.**

B) Eyepiece Lock Ring

The Eyepiece Lock Ring prevents the eyepiece from rotating. Once you have adjusted the position of the Eyepiece for your diopter setting, you can use the Eyepiece Lock Ring to keep it in place.

C) Reticle Ring

The Reticle Ring is used to plumb the reticle within the scope tube. To rotate the reticle, first loosen the two set screws on the Reticle Ring. Rotate the Reticle Ring until the reticle is plumb and retighten the two set screws.

D) Rear Micrometer Mount



The Malcolm 20X Vintage Target Scope comes with the Unertl style precision micrometer rear mount. This mount offers superbly crisp, precise adjustment clicks with zero backlash in between adjustments.

The rear mount bracket houses both the elevation and windage turrets. There are 25 clicks per rotation and the turrets can be reindexed by loosening the top slotted screw. We recommend tightening each turret's top screw to 7 – 8 in-lbs of torque.

The Malcolm Vintage Sniper Competition mounts are compatible with any $\frac{3}{4}$ " externally adjusted rifle telescope such as our Malcolm short scopes or Winchester A5s.

The Rear Micrometer mount offers 1/4 MOA (minute of angle) adjustment per click when the front and rear mount spacing measures 7.250" from center to center. The total adjustment of the rear mount will be over 125 MOA of elevation and windage, 60 MOA from the center in each direction.

E) Pope Rib

The Pope Rib is laser spot welded on the top of the scope tube. The Pope Rib prevents the scope from rotating within the mounts and facilitates sliding under recoil.

F) Knurled Slide Stop Ring

There are two slide stop rings. One is located before the front ring and one is located behind. The Slide Stop Ring positioned before the front ring (towards objective) is used to set the proper eye relief once the scope is pulled into battery. The second Slide Stop Ring behind the front mount (towards the eyepiece) limits the recoil travel of the tube and prevents the front mount from sliding off the pope rib. The rear slide stop ring is also used to keep the recoil spring in place.

G) Front Ring

The front mount provides a precise pivot system for the scope. The front ring slides on top of the pope rib. If you intend to use the Malcolm Vintage Sniper Competition mounts on a Malcolm Short Rifle Telescope, JW Fecker, Winchester A5 or other $\frac{3}{4}$ " Rifle Telescope without a pope rib, you will need to use a Sliding Lock Ring such as our 18SLR to enable the scope to slide.

H) Parallax Adjustment Lock Ring

The Parallax Adjustment Lock Ring prevents the Objective Lens Housing from moving. You will need to

loosen or tighten the Parallax Adjustment Lock Ring to change the parallax setting.

I) Objective Lens Housing

The Objective Lens Housing contains the objective lens. Moving the Objective Lens Housing is done by adjusting the Parallax Adjustment Lock Ring and Graduated Ring. This movement of the Objective Lens Housing and Objective Lens changes the parallax setting.

J) Graduated Ring

The Graduated Ring is indexed with numbers from 1-10. These reference numbers will allow you to reliably and repeatedly move the objective lens housing to the correct position to eliminate all parallax at the distance you are shooting. We recommend that you make a reference mark on the Graduated Ring and Sunshade once you have eliminated all parallax at distances you will frequently shooting.

K) Sunshade

The Sunshade prevents stray light from entering the objective bell. Additionally, there are a set of reference lines and distances on the sunshade. These references can be used to align the Graduated Ring when setting parallax.

L) Recoil Spring

The Recoil Spring automatically resets the scope into battery. If you remove the Recoil Spring, you will need to manually reset the scope into battery by pulling it rearward.

Section 3: Adjusting the Malcolm 20X Scope

Like the Unertl 8X, the Malcolm Vintage Target Scope is an externally adjusted rifle scope. This means that all the adjustments made in the rear micrometer mount will physically move the position of the scope.

The benefit of this is that all adjustments can be seen in the rear mount. If the scope is not holding zero, there is usually a malfunction that can be visually noted, such as the scope not seating properly in the mount or the mounts coming loose on the bases.

Ocular/Diopter Adjustment

The ocular focus position needs to only be set once, and no change is required unless the vision of the user changes.

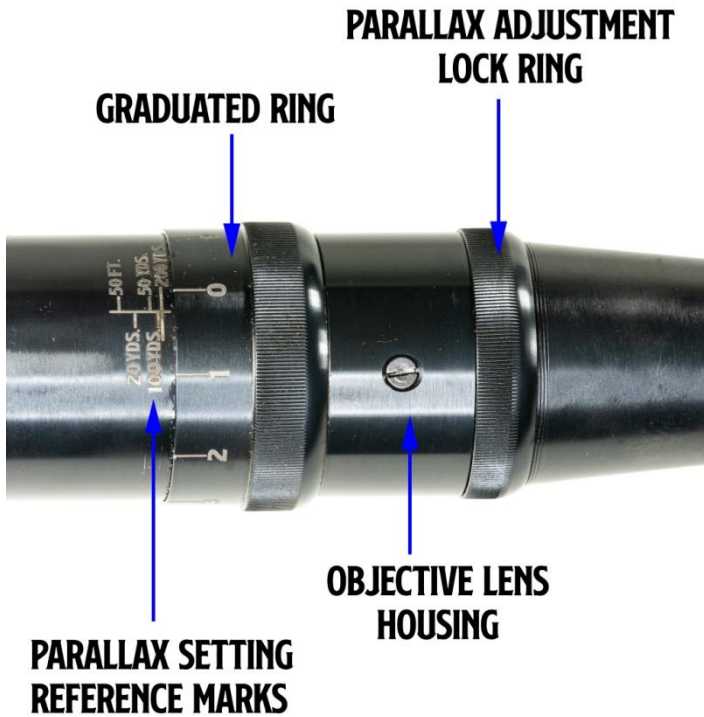
The diopter can be adjusted for the shooter's eyesight by rotating the eyepiece clockwise or counterclockwise.

Look through the eyepiece and adjust it until the reticle appears in sharp focus. Once the reticle is sharply defined, you may adjust the eyepiece lock ring so that it is flush with the eyepiece.

The lock ring will prevent the eyepiece from rotating, and secures the diopter setting.

Parallax Adjustment

Parallax is the apparent movement of the reticle on the field of view or target when viewed through the eyepiece from various head positions. Since the adjustment for parallax is very important, it is imperative that the rifle and scope be supported vibration free when setting the parallax, such as on a rifle vise or sandbags.



The following three steps are how to adjust the parallax setting:

- (1) Loosen the Parallax Adjustment Lock Ring
- (2) Rotate the Graduated Ring to the desired parallax setting.

For longer range settings, the Parallax Adjustment Lock Ring must be backed off sufficiently so that the Graduated Ring can drive the Objective Lens Housing until the appropriate parallax setting is shown on the Sunshade. Rotating the Parallax Adjustment Lock Ring counter clockwise will drive the Objective Lens Housing.

For closer range settings, rotate the Graduated Ring until the desired setting is shown on the Sunshade.

- (3) Rotate the Parallax Adjustment Lock Ring until the Objective Lens Housing is flush with the bottom of the Graduated Ring.

Scope Adjustment

The **Rear Micrometer Mount** houses the elevation and windage adjustment turrets. The adjustment value will depend on the mounting distance between the front and the rear mounts.

For 1/4 MOA adjustments, the front and rear mounts should be spaced 7.250" from center to center. The adjustment values will be coarser when mounted closer, and become finer when mounted farther apart.

Front to Rear Mount Spacing (center to center)	Adjustment Value per Tickmark
5.40"	1/3 MOA
7.250"	1/4 MOA
9.00"	1/5 MOA
10.80"	1/6 MOA
12.60"	1/7 MOA
14.40"	1/8 MOA

When the **Windage Turret** is turned **COUNTER CLOCKWISE**, the point of impact will move to the **RIGHT**. When the **Windage Turret** is turned **CLOCKWISE**, the point of impact will be move to the **LEFT**.

When the **Elevation Turret** is turned **COUNTER CLOCKWISE**, the point of impact will move **UP**. When the **Elevation Turret** is turned **CLOCKWISE**, the point of impact will be move **DOWN**.

Reindexing the Turret

The Malcolm 20X Vintage Target Scope mount's elevation and windage turrets can be reindexed after zeroing. Simply loosen the top screw on the elevation or windage turret. Once loosened,

you can rotate the elevation or windage turret without making adjustments. Rotate the turret cap so that the 0 on the turret cap lines up with the adjustment index mark on the turret shaft.

Next, tighten the top screw down to 7-8 in-lbs of torque.

For a video tutorial about properly tightening the Top Screw in the rear mount, scan here with your smart phone camera:



Section 4: Mounting the Malcolm 20X Scope

The front and rear mounts are designed to fit crescent cut scope bases. This type of base has been widely used for many traditional externally adjusted scopes, such as the Unertl, Lyman, and JW Fecker.

Mounting the Malcolm 20X Scope

The Rear and Front Mounts will slide directly on to the crescent cut scope bases.

Once the mounts are on the bases, position the mount so that the thumbnut will engage the crescent groove. We recommend tightening the thumbnut to finger tight first and rocking the mount back and forth to ensure that the thumbnut is properly seated in the crescent cut groove on the base.

Using the Malcolm thumbnut spanner, tighten the thumbnuts.

If the mounts are still loose when the thumbscrew is at the end of its travel, you may need to adjust the travel of the Mounting Thumbscrew.

Setting the Mounting Thumbscrew Travel

The mounting thumbscrew travel distance has been preset at the factory for the provided bases. However, there may be slight tolerances in the dimensions of the mounting blocks from different manufacturers. To overcome this, you can adjust the travel of mounting thumbscrew for the front and rear mounts.

You will need to remove the mounts from the scope body.

There are set screws at the bottom of the front and rear mounts. These set screws act as a friction screw on the crossbolt of the mounting thumbscrew and limit the horizontal travel of the thumbnut.

To access this set screw on the rear mount, you will need to back out the elevation turret completely.

To access this set screw on the front mount, you will need to remove the top cap, coil spring and pope rib plunger.

To set the crossbolt travel, first loosen the set screw at the bottom of the base. This will free the crossbolt on the mounting thumbscrew.

Next, remove the locking thumbnut and crossbolt.

Feed the crossbolt of the locking thumbscrew into the base. Adjust the position of the thumbnut until you can just barely slide the base through the grooves on the bottom without catching on the thumbnut.

When the thumbnut is in position, use a small flat head screw driver to tighten the crossbolt that is housed in the thumbnut. Hold the thumbnut in place with your other hand to prevent it from traveling while the crossbolt is being tightened.

Lastly, tighten down the set screws. This set screw only requires a few in-lb of torque to engage.

For a Video Tutorial on Setting the Mounting Thumbscrew Travel, scan here with your smart phone camera:



Section 5: Sighting in the Malcolm 20X VT Scope

- 1) Make sure that the mounts have been correctly and securely attached to the barrel and receiver using the proper bases. Make sure that the reticle in the scope has been leveled using the reticle frame locking collar.
- 2) Familiarize yourself with the adjustments on the scope. The elevation turret is located at the top of the rear mount. The windage adjustment is located at the right side of the rear mount.
- 3) Boresight the rifle and scope. Secure the rifle on sandbags or in a gun vise first. Remove the bolt and look through the barrel from the breech end. Center the barrel on a target at least 25 yards away. Look through the optic and try to get the crosshairs roughly lined up at the same target the barrel was pointing at.
- 4) We recommend sighting in at 25 yards. At this distance 1 MOA will move the point of impact $\frac{1}{4}$ ".

To move the point of impact to the **RIGHT**, turn the windage turret **COUNTER CLOCKWISE**.

To move the point of impact to the **LEFT**, turn the windage turret **CLOCKWISE**.

To move the point of impact **UP** turn the elevation turret **COUNTER CLOCKWISE**.

To move the point of impact **DOWN**, turn elevation turret **CLOCKWISE**.

- 5) Move target to 100 yards or your desired zeroing distance and repeat Step 4. At 100 yards, 1 MOA equates to roughly 1".

Section 6: Maintaining Your Rifle Scope

Your scope, though amazingly tough, is a precision instrument that deserves reasonable and cautious care. For normal maintenance:

- A. Do not attempt to disassemble or clean the scope internally.
- B. The external optical surfaces should occasionally be wiped with optical quality lens paper.
- C. Keep the protective lens covers in place when the scope is not in use.
- D. Remove any external dirt or sand with a soft brush so as to avoid scratching the finish.
- E. Wipe the scope with a damp cloth, followed by a dry cloth.
- F. Go over the metal portions of the scope with a silicon treated cloth in order to protect the scope against corrosion. **DO NOT USE** penetrating oils on this or any rifle scope.
- G. Store the scope in a moisture-free environment.
- H. Avoid storing the scope in a hot place. Never leave the scope where direct sunlight can enter either the objective or the eyepiece lens. Damage may result from the concentration of the sun's rays (burning glass effect).

WARNING: UNNECESSARY RUBBING OR USE OF A COARSE CLOTH MAY CAUSE PERMANENT DAMAGE TO LENS COATINGS.

For a video tutorial on cleaning your riflescope, scan here with your smart phone camera:



Section 7: DiamondTuff Lifetime Guarantee

Hi-Lux, Inc. warrants its products against defects arising from faulty workmanship, or materials, for the lifetime of the product. Any attempt to alter, dismantle or change the standard specifications of the products, will make this warranty null and void. This warranty is made to the original purchaser of the goods including all international sales, and applies only to the products purchased through our authorized distributors or dealers. The international warranty is subject to approval from our authorized distributor or us directly. The warranty is transferable.

Warranty obligation is limited to the repair or replacement of any product returned to **Hi-Lux, Inc. that is determined by the manufacturer to have defects arising from faulty workmanship** or materials that adversely affect the satisfactory operation of the product. It should be noted that on items containing an etched glass reticle that the occasional appearance of some small particles is common and not a warrantable repair. We only have a one-year warranty for the electronic components that are contained on the products.

Hi-Lux, Inc. reserves the right to request proof of purchase and purchase date. To guarantee warranty service, the enclosed warranty form must be completed and returned within ten (10) days of purchase to establish all warranty rights between you, the original purchaser, and **Hi-Lux, Inc.** We assume no liability

for any incidental or consequential damages, or incidental expenses. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusion may not apply to you. No warranties are made, or are authorized to be made, other than those expressly contained herein.

To file a claim under this warranty, please contact the Customer Service Department of **Hi-Lux, Inc.** at (310) 257-8142 to obtain a Return Authorization number (RA number). Please write the RA# on the service request form. Please be sure to include your name, address and phone number. Failure to obtain a RA number may result in either refusal upon delivery, or lengthy delays for warranty repairs and service required for the item returned to us.

All returns are to be shipped prepaid direct to **Hi-Lux, Inc.** including a check or money order in the amount of \$21 to cover postage and handling. Additional fees will be applied to all returns from outside of the United States.

Attn.: Warranty & Service Dept.

Hi-Lux, Inc.

3135 Kashiwa Street

Torrance, CA 90505

Tel: (310) 257-8142, Fax: (310) 257-8096

E-Mail: info@hi-luxoptics.com

www.hi-luxoptics.com

In the event of a non-warranty repair, you will receive an estimate prior to any work being done. This warranty gives you specific legal rights and you may have other rights, which vary from state to state. As defined by federal law, this is a limited warranty.



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